

GSL Diversity, Education, Outreach, and Service

Diversity leadership roles and memberships

- EEO Advisory Committee
 - Current representatives: DaNa Carlis, Melissa Petty (alternate)
 - Prior representatives: Penny Granville, Melissa Christianson (alternate)
- OAR Diversity and Inclusion Committee
 - Melissa Petty
 - Dave Turner
 - Terra Ladwig
- NOAA Diversity and Professional Advancement Working Group
 - DaNa Carlis
- Boulder Labs Diversity Council
 - Melissa Petty
 - Terra Ladwig
- Boulder Outreach and Communications Council
 - Susan Cobb
 - Hilary Peddicord
 - Melissa Petty
- ESRL Diversity and Inclusion Team
 - DaNa Carlis
 - Melissa Petty
- ESRL Student Internship Program
 - Susan Cobb (GSL Coordinator)

Student engagement to increase diversity within GSL

- American Indian Science and Engineering Society (AISES)
 - GSL hosted a NOAA booth at the 2018 and 2019 national conferences to increase awareness of NOAA careers, science, and products and co-hosted an activity during the Boeing Science Day.
- NOAA Cooperative Science Center in Atmospheric Sciences and Meteorology (NCAS)
 - 2016 GSL established a relationship with Howard University to recruit students.
 - 2017 GSL invited six faculty and students from Howard University to visit NOAA Boulder to expand engagement with scientists and programs. Howard University is the lead institution of the NOAA Cooperative Science Center in Atmospheric Sciences and Meteorology.
 - 2017 GSL leadership traveled to the University of Texas El-Paso to meet with faculty and students and look for future collaborations.
 - 2018 NOAA's 9th Biennial EPP/MSI Education and Science Forum: GSL leadership attended the meeting that gathered nearly 150 students from more than thirty

- minority-serving institutions engaged in collaborative research with NOAA and keenly interested in careers within the agency.
- GSL met with faculty and students from CREST in NYC, an NCAS school to discuss the NWS Water Model and related collaborations.
- 2018 - GSL organized and hosted students from UTEP. During the two-day event five students presented their research and students and ESRL staff participated in break-out groups for focused discussion to look for connections.
- 2019 GSL Scientists participated in the NCAS_M “Project Fest” workshop.
- Government Career Day for University of Colorado - Denver, Metro State, and Colorado Community College
 - 2018, 2019 GSL was the lead on the NOAA Booth on campus to recruit students.
 - 2021 GSL led Virtual Career Day activities and hosted breakout rooms and one-on-one sessions with students.
- Denver Public School Career Connect Program
 - Attended the 2018 celebration and recruited students for 2019 internships
 - Mentored five students from 2016-2019
- American Meteorological Society
 - GSL Scientist gave an invited presentation: “New Minds for New Science” in Washington, D.C. at an AMS Workshop covering diversity topics associated with the Hazard Services project.
 - DaNa Carlis was Invited to give a talk to the Metro Atlanta Chapter of the American Meteorological Society (AMS) and National Weather Association (NWA). DaNa’s talk was titled “An Unscripted Journey: Science, Policy, and Leadership.” ([Recording on YouTube](#))
- University of Colorado
 - 2019 GSL Scientists participated in the University of Colorado “Atmospheric and Ocean Sciences Department Industry Night”, an outreach effort at the Atmospheric and Oceanic Sciences Department. The event was designed so undergraduate and graduate students could meet folks from industry, academia, and government agencies to talk about careers and opportunities.
 - 2019 GSL scientists gave a talk to the CU Leeds School of Business on “New and Disruptive Technologies.”

GSL Mentors

- Amanda Back
 - Writing mentor for a SOARS student from Binghamton University.
 - 2020 - Mentored a community college student for Research Experience for Community College Students (RECCS-lite) through CIRES. The project was: “Analysis of Modeled Wildfire Smoke Forecasts Using Ground Observed Aerosols.”
- Stan Benjamin

- 2017 - Graduate student from Colorado State University
 - 2017 - Summer undergraduate intern from Penn State University
 - 2018 - Mentored a postdoc
- John Brown
 - 2017 - 2018 National Research Council postdoc
 - 2018 - National Research Council postdoc
 - 2018 - Graduate student co-sponsored by GSL and PSL
- DaNa Carlis
 - Serves as an informal mentor to currently two NOAA employees with monthly sessions
- Susan Cobb
 - 2017 - Summer intern from Front Range Community College
 - 2018 - Summer intern from Denver Public Schools Career Connect
 - 2019 - Summer intern from DPS Career Connect.
 - 2019 University of Colorado Environmental Studies major volunteering for credit for fall semester
- Mike Fiorino
 - 2017 - Hollings Student from the University of Oklahoma
- Georg Gell
 - 2017 - 2018 NOAA Cooperative Science Center in Atmospheric Sciences Postdoc from Howard University
 - 2019 - NOAA Experiential Research & Training Opportunities (NERTO) student (with Jaymes Kenyon)
- Jaymes Kenyon
 - 2019 - NOAA Experiential Research & Training Opportunities (NERTO) student (with Georg Grell)
- Darrell Kingfield
 - 2019 - Ph.D. student
 - 2020 - Two M.S. students at SUNY Stony Brook
 - 2020 - M.S. student at Texas Tech University
 - 2020 - Research Experience for Undergraduates Southwestern Oklahoma State University student
- Jonathan Joyce
 - 2018 - Mentored an undergraduate student
- Terra Ladwig
 - 2016 - Mentored a SOARS/Hollings student from Millersville University
 - 2017 - Student from NCAR's Significant Opportunities in Atmospheric Research and Science (SOARS) program.
- Tony Laio
 - 2019 - Intern (with Jebb Stewart)
- Melinda Marquis

- 2018 - Student from Texas A&M
- Daniel Nietfeld
 - 2017 - Summer undergraduate intern from the University of Washington (with Jebb Stewart)
- Joe Olson
 - 2016 - Graduate student from the University of Colorado
 - Mentor and member of the doctoral thesis committee for a Ph.D. candidate in the Department of Engineering at the City College of New York.
- Hilary Peddicord
 - 2018 - National Centers for Coastal Ocean Science (NCCOS) summer intern
- Melissa Petty
 - 2018 - Writing mentor for SOARS student from Millersville University
- Tanya Peevey
 - 2020 - Mentors a college student at Central Michigan University.
- Greg Pratt
 - 2018 - Summer intern from Fairview High School, Boulder CO
- Beth Russell
 - 2017 - National Centers for Coastal Ocean Science (NCCOS) intern from Bates College
- Keith Searight
 - 2017 - Student from National Chiao Tung University in Taiwan
- Jeff Smith
 - 2018 - Summer intern from Denver Public Schools Career Connect program
- Jebb Stewart
 - 2016 - 2017 Graduate student Intern from Colorado State University
 - 2017 - 2019 Summer undergrad intern
 - 2018 - Student from University of Colorado-Boulder
 - 2018 - Undergraduate intern
 - 2019 - Intern (with Tony Laio)
- Zoltan Toth
 - 2017 - Visiting Scholar Postdoc
- Dave Turner
 - 2018 - Postdoc who was born in Ethiopia and is currently a Canadian citizen
 - 2020 - Hollings Student
 - 2020 - Ph.D. student from the University of Oklahoma
 - 2020 - Ph.D. student University of Miami
 - 2020 - Ph.D. student Washington State University
 - 2020 - Ph.D. student University of Maryland Baltimore County
 - 2020 - Ph.D. student U of Maryland Baltimore County
- Jeff Van Buskirk
 - 2016 - Summer intern from Denver Public School Career Connect

- 2017 - Summer intern from Denver Public School Career Connect
- 2018 - Summer intern from University of Colorado - Denver
- 2019 - Summer Loveland High School Intern

Employee Recognition and Awards in Diversity, Education, and Outreach

- Denver Public Schools (DPS) Career Connect Program
 - Released a video that showcases four DPS students who interned at NOAA Boulder last summer. GSL's Jeff Van Buskirk was highlighted for mentoring a DPS student. <https://vimeo.com/212668053>
- 2017 EEO/Diversity Individual Award
 - Melinda Marquis for leading the development of the ESRL Diversity and Inclusion Plan in coordination with the EEO/Diversity Office. Melinda was also instrumental in bringing three graduate students and postdocs to ESRL Global Systems Division (GSL), one each from the National Research Council, Howard University, and the University of Colorado. She also coordinated visits to Howard University in 2016 and, in September 2017, the University of Texas El-Paso.
- 2017 EEO/Diversity Laboratory of the Year
 - For the combined efforts of all ESRL divisions. ESRL allocated dedicated resources to EEO, had excellent divisional employee completion rates for FY17 Sexual Harassment Training, completed the ESRL Diversity and Inclusion Plan, contributed articles to the March and July (Special Student Edition) EEO Newsletter, creatively used various programs to establish a wide array of special internship positions, worked in the community and had strong educational outreach, and increased involvement in tribal engagement activities.
- 2020 Federal Labs Consortium Technology Transfer Impact Award
 - Received by the SOS Explorer team for making “a tangible and lasting impact on the populace or marketplace, ranging from a local to a global scale.”
- 2020 Cooperative Institute for Research in Environmental Sciences Outstanding Performance Award in Service
 - For designing a mentorship program to improve workplace satisfaction and foster a more creative and productive research atmosphere: Hilary Peddicord
- 2020 CIRES Outstanding Performance Award in Service
 - For developing a mobile application that brings Science On a Sphere® visual data to smartphones and devices: Hilary Peddicord, Beth Russell, and Jonathan Joyce

Cross GSL activities and groups

- GSL's Evergreen Group
 - The Evergreen Group is a voluntary group of GSL team members whose interest is to strengthen GSL and support GSL management objectives. This is accomplished by maintaining a clear dialogue between GSL Management and team members to

promote a healthy, inclusive, transparent, and collaborative working environment that nurtures current and future leaders. The Evergreen Group promotes interactions between management and team members and fosters cross-division activities including training sessions and large organization events such as the annual GSL retreats. The Evergreen Group has a membership of 55 persons and has had regular events and meetings since 2016.

- **GSL's Peer Coaching Group**
 - GSL maintains a voluntary group of seven team members who meet monthly to help each other confidentially solve problems in the workplace and grow in their careers.
 - **GSL Social ½ Hour**
 - Monthly 30-minute half hour to encourage GSL staff to connect socially
 - **GSL Special Events**
 - Hillary Allen - special seminar on “Resilience” to acknowledge one year of remote working
 - Retreats - GSL hosts yearly all-staff retreats
 - Holiday Parties - GSL hosts yearly holiday parties virtually or in person
 - “Can We Talk?” panel discussion
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Community Outreach and Service

Staff from the Global Systems Laboratory support a widespread and diverse array of off-site outreach and service efforts. There is a deep and abiding desire within the GSL team regarding the importance of educating the public on the NOAA mission and the meaning and impact of science in our world.

- **Amanda Back**
 - 2017 - Served as an oral session moderator and poster judge at Colorado State University's Multicultural Undergraduate Research Art and Leadership Symposium
 - 2020 - Judged student posters at the 2019 American Geophysical Union Fall Meeting in San Francisco, CA
 - Judged poster presentations for Celebrate Undergraduate Research and Creativity at CSU
 - 2020 - Judged undergraduate abstracts, graduate abstracts, and travel grant applications for the SACNAS conference
 - 2020 - Reviewed a submission to the Women in Math and Public Policy/Association for Women in Mathematics Springer text
- **Stan Benjamin**
 - 2016 - Spoke to a 2nd grade Class at Superior Elementary School about weather, clouds, and weather instruments

- Christina Bonfanti (Kumler)
 - 2017 - Served as Senior Assistant Captain Judge in Mathematical and Computer Science
 - 2019 - Served as a judge at the Boulder County Regional Science Fair
 - 2019 - Hosted a NOAA Booth at the Women in Science event at the University of Wyoming and taught three classes on machine learning to middle and high school girls
 - 2020 - Served as a judge for the virtual Colorado State Science and Engineering Fair
- John Brown
 - 1990-present Operates the Boulder Cooperative Weather Station and provides daily weather data to the Boulder Daily Camera
- Susan Cobb
 - 2016 - Lead a tour group for 8th Grade Science Days
 - 2017 - Hosted a NOAA booth at the University of Wyoming Women in Science conference for 450 high school girls
 - 2018 - Spoke about weather to a 3rd grade class at Flatirons Academy about weather and weather safety
 - 2019 - Staffed the NOAA booth at the Colorado Science Conference for teachers
 - 2019 - Spoke to a 3rd grade class at Flatirons Academy about weather and weather safety
 - 2019 - Visited with a student from Colorado State University about science writing and communications
 - 2019 - Answered questions from ten preschools and their parents about scary weather
 - 2020 - Was a tour guide for 8th Grade Science Days
 - 2020 - Hosted a NOAA Boulder booth at American Meteorological Society's WeatherFest in Boston, MA, a public outreach event attended by several thousand people
- Jeff Duda
 - 2020 - Scholarship reviewer for CU Norlin Scholarship program
- Brian Etherton
 - 2016 Spoke about weather to four Kindergarten classes at Red Hawk Elementary School in Erie, Colorado
- Phyllis Gunn
 - 2020 Staffed the NOAA Boulder booth at the Denver Public Schools 8th Grade Career Fair
- Shilpi Gupta
 - 2018 - Staffed the NOAA booth at Girls and Science Day at the Denver Museum of Nature and Science
 - Provided alternative approaches to usage of Science On a Sphere® involving

artists and community members;

- Erik Hackathorn
 - 2016 - Led educational events for 8th Grade Science Days
 - 2016 - Demonstrated Science On a Sphere Explorer at the Denver Museum of Nature and Science
 - 2017 - Staffed the NOAA Booth at the Colorado Science Teachers Conference
 - 2018 - Staffed a NOAA Booth at the Denver Science, Technology, Engineering, Arts, and Math event
 - 2019 - Staffed the NOAA booth at the Colorado Science Conference for teachers and gave a presentation
 - 2020 - Demonstrated Science On a Sphere Explorer at Super Science Saturday in Boulder, CO
 - 2020 - Gave a talk on “Weather and Ocean Phenomena” to Rocky Mountain Christian Academy
- Tracy Hansen
 - 2016 - Served as a mentor on the graduate advisory committees of several minority students
- Shannon Johnston
 - 2017 - Gave a presentation on network security at Fireside Elementary School
- Michael Kraus
 - 2016 - 2017, 2020 - Science Fair Judge at Boulder Country Day School
- Terra Ladwig
 - 2018 - Staffed the NOAA booth at Girls and Science Day at the Denver Museum of Nature and Science
 - 2019 - Is a “Skype a Scientist” volunteer and Skyped with 5th graders in Iowa
 - 2020 - Recorded Python training to share on LinkedIn
 - 2020 - Did a 1-hour “Skype a Scientist” session with Murray Avenue School in Huntingdon Valley, PA
 - 2020 - Volunteer as mentors with the Cooperative Institute for Research in Environmental Sciences Mentoring Program
 - 2020 - Two “Skype a Scientist” sessions with four 4th Grade classes at the American International School in Chennai, India
- Tom LeFebvre
 - 2016 - Mentored a Boulder High School student and helps with his science fair project
- Jennifer Mahoney
 - 2017 - Panelist for Women in Science - American Physical Society’s Conference for Undergraduate Women in Physics
- Bill Moninger
 - 1980-2020 - Served as judge for the Colorado State Science and Engineering Fair
 - Served as Chair for the Senior Division Physics Judging Team and member of the

Best of Fair judging team

- Scott Nahman
 - 2016-2020 Serves as Executive Vice President for the 7x24 Exchange Rocky Mountain Chapter
 - 2020 Facilitated an educational forum to promote a better understanding of design, execution, and management issues involved in achieving reliability with mission-critical systems and operations
- Hilary Peddicord
 - 2016 - Led educational events for 8th Grade Science Days
 - 2017 - Staffed the NOAA Booth at the Colorado Science Teachers Conference
 - 2018 - Presented to 30 Latino students at San Lazaro manufactured home park for an after-school program in Boulder, Colorado
 - 2019 - Staffed the NOAA booth at the Colorado Science Conference for teachers and gave a presentation
 - 2019 - Presented at “Science on Tap: NOAA Data Visualization at the Gunbarrel Brewing Company in Boulder, CO
 - 2020 - Led an educational event for 8th Grade Science Days
 - 2020 - Hosted a NOAA Boulder booth at American Meteorological Society’s WeatherFest in Boston, MA, a public outreach event attended by several thousand people
 - 2020 - Gave a talk to Boulder High School on Environmental Science at NOAA
 - 2020 - Gave a demonstration using Science On a Sphere® to New Vista High School”
 - 2020 - Presented to hundreds of 5-7th Grade students as part as NOAA Live! Webinar Series.
 - 2020 - Produced educational videos for Facebook
 - 2020 - Volunteer as a mentor with the Cooperative Institute for Research in Environmental Sciences Mentoring Program
 - 2020 - Helped plan and led the CIRES Mentoring Program Kick-off event webinar
- Tanya Peevey
 - 2017 - Panelist for Women in Science - American Physical Society’s Conference for Undergraduate Women in Physics
- Melissa Petty
 - 2017 - Panelist for Women in Science - American Physical Society’s Conference for Undergraduate Women in Physics
- Michael Rabellino
 - 2017 - Served as a mentor to students participating in the HackCU event
- Jim Ramer
 - Tutors at The Family Learning Center in Boulder, where 95% of the participants are low-income and 90% are multicultural students (2016)
- Beth Russell (Wehe)

- 2016 - Volunteered with the Women's Ministries at Cornerstone Church in Boulder
 - 2016 - Led educational events for 8th Grade Science Days
 - 2020 - Produced educational videos for Facebook
 - 2020 - Volunteers as mentor with the Cooperative Institute for Research in Environmental Sciences Mentoring Program
- Keith Searight
 - 2018 - Staffed a NOAA Booth at the Denver Science, Technology, Engineering, Arts, and Math event
- Ed Szoke
 - 2016 - Led educational events for 8th Grade Science Days
 - 2017 - Spoke to a 5th Grade about weather
- Matthew Wandishin
 - 2016 Taught weather and weather safety classes to 6th graders at the Classical Catholic Enrichment Homeschool Co-Op
- Man Zhang
 - 2018 - Staffed the NOAA booth at Girls and Science Day at the Denver Museum of Nature and Science

Attendance at other events showcasing NOAA

- National Space Symposium
- National Association of Science and Technology Centers
- National Association of Independent Schools
- ISTE (technology in education)
- Visualise: Visualization for Informal Science Education
- National Science Teachers Association
- National Broadcasters Association
- National Middle School Teachers
- National Get Outdoors Day
- Science On a Sphere Users Collaborative Network Workshop
- Meteorological Technology World Expo
- Wyoming STEM Teachers Conference

Science Community Education by the Developmental Testbed Center (DTC) collaboration between NCAR and GSL (2016-2020)

- Visitor Program
- Engagement with DTC visitors (PIs and graduate students) (2016-2020)
- Workshops
 - Unified Forecast System (UFS) Users' Workshop (July 2020)
 - UFS Workflows Workshop and CROW Review (April 2020)
 - 2018 DTC Community Unified Forecast System Test Plan And Metrics Workshop (July-August 2018)

- NGGPS Atmospheric Physics Workshop (November 2016)
- 7th NCEP Ensemble Users Workshop (June 2016)
- NGGPS Sea Ice Modeling Workshop (February 2016)
- Tutorials
 - Unified Forecast System (UFS) Medium-range Weather (MRW) Application Users' Training (November 2020)
 - AMS Short Course: Experimentation and Development of Physical Parameterizations for Numerical Weather Prediction Using a Single-column Model and the Common Community
 - Physics Package (CCPP) (January 2020)
 - METplus Tutorial (February 2019)
 - 2018 Hurricane WRF Tutorial (January 2018)
 - 2017 Joint DTC-EMC-JCSDA GSI/ENKF Tutorial (July 2017)
 - HWRF tutorial at the NCWCP (January 2016)

Science On a Sphere® (SOS) Program

Science On a Sphere® has become NOAA's premiere education and outreach tool, reaching 67 million people around the world each year. GSL developed this "power-hitter" in the world of NOAA education and outreach and continues to infuse leading-edge technologies into the SOS system to enhance its visual impact and increase access to earth science information by audiences around the world. Science On a Sphere® is a gleaming 6-foot-diameter, carbon-fiber globe invented by Dr. Alexander E. MacDonald to educate and inspire any onlooker with the science it presents. This spherical movie screen was patented (2005) for its extraordinary multiyear design and software development accomplished initially by the late David Himes. It is a visualization tool that provides very high impact for every educational exhibit it enhances. Now in over 170 locations worldwide and still growing, SOS informs millions of people daily about our planet with the most current science available. NOAA Boulder is the home of SOS, housed in the "David Himes Planet Theater." SOS is used extensively in organized outreach efforts and provides a spectacular finale for nearly every visitor to the David Skaggs Research Center (DSRC) in Boulder, Colorado.

A desktop version of SOS called SOS Explorer was released in 2015 and has now been installed in almost 40 locations around the world. SOS Explorer creates a 3-D interactive Earth on a flat-screen display including projection on walls, computers, and other large displays. This provides teachers, students, and the public access to a library of selected Science On a Sphere® datasets and movies. The visualizations show information provided by satellites, ground observations, and computer models, and rapidly animates through real-time global data. In addition, tools included in the application allow users to zoom in, probe, and graph the data, as well as add supplementary material including websites, videos, pictures, and place marks. In order to make the product more accessible for teachers, lesson plans and pre-programmed tours through standards-relevant topics are provided.

In August of 2019, the SOS Explorer team launched SOS Explorer Mobile, a free mobile app for Apple and Android devices. It includes over 120 of the best SOS datasets and many of the same features and tools at the exhibit version of SOS Explorer. With the mobile version, SOS Explorer is now available to anyone who wants it. In 2020, the SOS Explorer team was awarded the Federal Labs Consortium 2020 Impact Award for expanding the reach of NOAA through SOS Explorer and SOS Explorer Mobile.

During the pandemic lockdown, Hilary Peddicord and Beth Russell used SOS Explorer to create a series of nine video presentations with topics ranging from marine debris to climate change to the solar system and the sea floor. Videos ranged from 3 to 15 minutes and featured the use of SOS Explorer for education. The videos were posted to Facebook and YouTube. Links to the videos are available here:

<https://sos.noaa.gov/sos-explorer/sosx-video-gallery/>

- Hilary Peddicord and Beth Russell presented on SOS Explorer as part of NOAA Central Region 3 Minute Thesis Webinar on “Communication and Engagement in a Virtual World.”
- Hilary Peddicord and Beth Russell were guest presenters on NOAA Live!, a virtual webinar series hosted by Woods Hole Sea Grant. The title of their presentation was “Explore the World with NOAA's Fun, New App.”
- Hilary Peddicord and Beth Russell participated virtually in NOAA Boulder’s 8th Grade Science Day with a SOS Explorer presentation on the Earth system.
- Science On a Sphere®(SOS) Internet Presence
 - Website Analytics for SOS (<https://sos.noaa.gov/>)
 - 2016 - 595,236 page views
 - 2017 - 600,017 page views
 - 2018 - 597,335 page views
 - 2019 - 672,783 page views
 - 2020 - 725,176 page views
 - Facebook Likes on Dec 31, 2020 - 318,733
 - In 2020. 3.1M minutes of SOS videos viewed, with 8.7M 3 second video views
 - Top video - Earthquakes 2001 - 2015 - 15.7M 3 second video views
 - Instagram Followers on Dec 31, 2020 - 1869
 - YouTube Subscribers on Dec 31, 2020 - 5,500

On-site Visits

The general public has been on site for numerous tours and visits over the years. This has continued up until the pandemic closure in March 2020. These visits include numerous community groups, school groups, university classes, visitors with business in the David Skaggs Research Center, and groups representing other government agencies. Nearly every building tour includes a docent-led presentation in GSL’s David Himes Planet Theater, which houses the Science On a Sphere®.

In 2016 through the first quarter of 2020 GSL had over 21,700 visitors to the SOS. This visit is extraordinarily popular and continues to be noted as a highlight of a visit to this facility.

Science On a Sphere® (SOS) Presentations in the Boulder David Skaggs Research Center (DSRC)

GSL's SOS in the DSRC is a popular destination for weekly facility tours for the public, professional visitors to the facility, and student groups from throughout the area with thousands of visitors per year.

The following table shows visit counts to the SOS per year. Note that in FY18 new visitor restrictions were placed on the DSRC which reduced the visitor count and in FY20 the COVID-19 pandemic stopped all visits beginning in March 2020.

	FY16	FY17	FY18	FY19	FY20
SOS visitors	5811	5467	4807	4325	1323